JS 9/13/21
RJA 2/17/22

[redacted]

P-18-0324

Chemical Name: [redacted]

CASRN: [redacted]

[redacted]

ASSIGNMENTS	NAME	DATE
SAT Chair	William Irwin	10/10/18
HH Hazard Assessor (A)	Keith Salazar	10/10/18
HH Hazard QC Reviewer (A)	Iris Camacho	10/12/18
HH Risk Assessor FOCUS (B)	Sailesh Surapureddi	11-05-2018
HH Risk QC Reviewer (B)	Amy Benson	11-05-2018

Human Health Report Status:		DATE COMPLETED
X	HAZARD DRAFT- Pending Review	10/10/2018
X	HAZARD REVIEWED	10/12/18
X	HAZARD FINAL	10/12/18
X	RISK DRAFT- pending review	11-04-2018
X	RISK REVIEWED	11-05-2018
X	RISK-FOCUS FINAL- Uploaded	11-05-2018
	POST-FOCUS UPDATE DRAFT	
X	POST-FOCUS UPDATE FINAL- Uploaded	11-28-2018

[redacted]

1 HUMAN HEALTH SUMMARY

EPA estimated the human health hazard of this chemical substance based on its estimated physical/chemical properties, available PMN data, and by comparing it to structurally analogous chemical substances for which there is information on human health hazard, and other structural information. EPA concludes there is moderate concern for human health hazard for the chemical substance.

Based on the hazard determination and available quantitative risk information, EPA [concludes that there is risk for the PMN substance. The risk estimates for this chemical are for the intended conditions of use. Other conditions of use and their risks were not evaluated.

1.1 Hazard Summary

1.1.1 Absorption / Metabolism

Absorption is expected to be NIL for the parent polymer and NIL to poor for the low molecular weight fraction with reaction all routes, based on physical/chemical properties. The absorption of the methanol reaction product is expected to be good all routes.

1.1.2 Structural Alerts

- Waterproofing
- Alkoxysilanes

1.1.3 Hazard Concerns

- Concern for lung waterproofing and irritation to the eye, skin, mucous membranes, and lung, based on the reaction of alkoxysilanes.
- Concern for neurotoxicity and developmental toxicity by released methanol.

1.2 Exposure and Risk Characterization

1.2.1 Workers

Risks were identified workers, for lung effects via inhalation based on quantitative hazard data for an analogue, trimethoyxy silane, (MOE = 5.9; benchmark MOE = 100). Inhalation fold factor 17.

Risks were identified workers for neurotoxicity and developmental effects via inhalation exposure based on Methanol (MOE = 0.49; benchmark MOE = 1).

Risks were identified workers for neurotoxicity and developmental effects via dermal exposure based on Methanol (MOE = 0.1; benchmark MOE = 1).

Quantitative risks would be mitigated if exposures can be controlled by the use of appropriate PPE, including impervious gloves, eye protection and a respirator. An APF of 25 is suggested based on an inhalation fold factor of 17.

[redacted]

Risks for irritation cannot be quantified due to lack of dose-response for irritation hazards. However, exposures can be controlled by the appropriate PPE including impervious gloves, eye protection and a respirator. EPA expects that the workers will use appropriate personal protective equipment (i.e impervious gloves, eye protection, respirator), consistent with the Safety Data Sheet prepared by the LVE submitter, in a manner that is adequate to protect them.

1.2.2 General Population

Risks were not identified for the general population for neurotoxicity and developmental effects via drinking water and fish ingestion exposure based on methanol (MOE = 46; benchmark MOE = 1).

Risks were not identified for the general population for neurotoxicity and developmental effects via fugitive air inhalation exposure based on methanol release (MOE = 28; benchmark MOE = 1).

Risks were not identified for general population for lung toxicity via fugitive air inhalations based on quantitative hazard data for the analog trimethoxysilanes (MOE= 238; benchmark MOE=100)

Risks were not identified for the general population for irritation/sensitization effects via drinking water/fish ingestion since these hazards are not expected to result from well-diluted concentrations.

1.2.3 Consumers

Risks were not assessed because consumer exposures are not expected

1.3 Potentially Useful Information:

1.3.1 Assumptions and Uncertainties

Absorption of the PMN is based on p-chem properties and analogues
Metabolism is assumed to be important to release methanol
There are no measured data on the PMN substance itself.
Health effects are based on analogue data/structure/metabolite

1.3.2 Potentially Useful Information

Potentially useful information would inform understanding of:

Irritation-Skin
Eye Damage
Pulmonary effects
Neurotoxicity

[redacted]

Developmental toxicity

2 HUMAN HEALTH HAZARD- PART A

2.1 Chemistry Summary

PMN: P-18-0324	Subm[redacted]	Manu.	Import
Max. PV (KG): [redacted]	Binding Option Marked:		X
MW: [redacted]	% < 500 [redacted]	% <1000	CASN [redacted]

PMN Structure	Prop.	Meas.	Est.
[redacted]	MP		
	BP		>400
	Pres.		at 760 mm Hg
	VP		<0.000001
	S-H2O		Reacts
	log P		

[redacted] Analogues: [redacted]

USE:

Resin/binder in paint formulations for industrial and architectural applications.
Si-OMe [redacted]

[redacted]

2.1 SAT Summary

2.1.1 PMN Health Rating

H=2

2.1.2 SAT Key Words

IRR-E, S, MM, L; Neuro; Lung
Irritation (reactivity)
Neuro=Neurotoxicity
Lung= Waterproofing

[redacted]

2.1.3 Absorption

Absorption is expected to be NIL for the parent polymer and NIL to poor for the low molecular weight fraction with reaction all routes, based on physical/chemical properties. The absorption of the methanol reaction product is expected to be good all routes..

2.1.4 SAT Health Summary

There is concern for lung waterproofing and irritation to the eye, skin, mucous membranes, and lung, based on the reaction of alkoxysilanes. There is concern for neurotoxicity and developmental toxicity by methanol release

2.1.5 Exposure Routes of Interest

Route of Interest	
x	Inhalation:
x	Dermal:
x	Ingestion:

2.2 Toxicity Data

2.2.1 PMN Data (study summary, POD, same-as)

Methanol IRIS RfD = 2 mg/kg/day
Methanol IRIS RfC = 20 mg/m3

Analog data for [redacted]
Salmonella assay negative with and without activation;
Not an eye irritant in female rabbits;
Rat (F) acute (15D) oral (gavage) toxicity LD50 > 2000 mg/kg;
Not a demal sensitizer in female mice;
Not a dermal irritant in female rabbits
Analog data for [redacted]
Salmonella assay negative with and without activation;
Negative for chromosome aberrations in CHO cells with and without activation;
Not an eye irritant in female rabbits;

[redacted]

2.2.2 **Analogue/Metabolite Data** (chemical, structure, study summary, POD)

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(38) ANALOGUES:

PMN or CAS No.	Chem. Name	Structure	TSCA Y/N
[redacted]			

[redacted]

2.2.3 **SDS Data** (composition, hazard identification, toxicological information)

2. Hazard(s) identification

Hazard Classification

Physical Hazards

Flammable liquids	Category 3

Health Hazards

Germ Cell Mutagenicity	Category 1B
Carcinogenicity	Category 1B

Unknown toxicity - Health

Acute toxicity, oral	0 %
Acute toxicity, dermal	0 %
Acute toxicity, inhalation, vapor	0 %
Acute toxicity, inhalation, dust or mist	0 %

Mixtures

Chemical Identity	CAS number	Content in percent (%)*	Notes
SOLVENT NAPHTHA (PETROLEUM), LIGHT AROM.	64742-95-6	10 - <20%	No data available.
n-butylacetate	123-86-4	5 - <10%	# This substance has workplace exposure limit(s).

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume

11. Toxicological information

Information on likely routes of exposure

Ingestion:	No data available.
Inhalation:	No data available.
Skin Contact:	No data available.
Eye contact:	No data available.

Symptoms related to the physical, chemical and toxicological characteristics

Ingestion:	No data available.
Inhalation:	No data available.
Skin Contact:	No data available.
Eye contact:	No data available.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product:	Not classified for acute toxicity based on available data.
Specified substance(s):	
SOLVENT NAPHTHA (PETROLEUM), LIGHT AROM.	LD 50 (Rat, No data available.): 6,800 mg/kg
n-butylacetate	LD 50 (Rat, No data available.): 14,000 mg/kg

Dermal

Product:	Not classified for acute toxicity based on available data.

Inhalation

Product:	Not classified for acute toxicity based on available data.
Specified substance(s):	
SOLVENT NAPHTHA (PETROLEUM), LIGHT AROM.	LC50 (Rat, No data available.): 10.2 mg/l
n-butylacetate	LC50 (Rat, No data available.): 2,000 mg/l

Repeated dose toxicity

Product:	No data available.

Skin Corrosion/Irritation

Product:	No data available.

[redacted]

2.2.4 Other Information

None

2.3 Human Health Category (From US EPA 2010 document)

Chemical Category: Alkoxysilane

Chemical Category Health Concerns:

Health - Concern for lung toxicity from inhalation of vapors or aerosols is based on data for a number of low-molecular-weight alkoxysilanes. Trimethoxysilane (TMS) is clearly the most toxic member of the class causing irreversible lung effects at low doses, but the Agency does not consider it appropriate to use TMS as a regulatory benchmark for all alkoxysilanes.

For trimethoxysilane monomers and polymers with a low trimethoxysilyl equivalent weight, a NOAEL of 10 ppm (about 11 mg/kg/day) based on a 90-day study with vinyltrimethoxysilane in monkeys is deemed an appropriate generic benchmark.

Category Testing Strategy:

1. 90-day subchronic test in rodents by the inhalation route (Harmonized Test Guideline 870.3100).

2.4 Point of Departure Selected and Basis

2.4.1 POD for lung effects based on trimethoxysilane

POD type: NOAEL
POD Value: 11 mg/kg-day
POD Chemical: trimethyoxysilane
POD Route: Inhalation
POD Hazard Endpoint: Lung toxicity
POD Basis: Protects for lung effects due to alkoxysilane concerns
POD Benchmark MOE: 100 (10 for interspecies, 10 for intraspecies)
Reference: US EPA. 2010. TSCA New Chemicals Program (NCP) Chemical Categories. https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/new-chemicals-program-under-tsca

2.4.2 POD for Methanol Oral

1. **POD type (NOAEL/LOAEL)** - RfD
2. **POD Chemical:** - Methanol
3. **POD Route:** - Oral
4. **POD Endpoint:** - Extra cervical ribs in a mouse inhalation study.
5. **POD Value:** - EPA IRIS RfD = 2 mg/kg/day.
6. **POD Basis:** - RfD based upon extra cervical ribs in a mouse inhalation developmental toxicity study. This POD requires an HQ assessment, not an MOE comparison. The RfD was derived with PBPK modeling and the following UFs:
7. **POD Benchmark MOE:** - 1
    a. This POD requires an HQ assessment, not an MOE comparison. The RfD was derived with PBPK modeling and the following UFs:

[redacted]

i. UF human = 10
ii. UF animal = 3
iii. UF database = 3

8. **Reference: -** US EPA. 2013. Toxicological Review of Methanol (NonCancer). EPA/635/R-11/001Fa. www.epa.gov/iris

2.4.3 POD for Methanol Inhalation

1. **POD type (NOAEL/LOAEL)** - RfC
2. **POD Chemical:** - Methanol
3. **POD Route:** - Inhalation
4. **POD Endpoint:** - Brain weight in rat pups at 6 weeks of age in a rat developmental inhalation exposure through gestation and 3,6, or 8 weeks postnatal.
5. **POD Value:** - EPA IRIS RfC = 20 mg/m^3 for 24 hours exposure, 7 days a week (e.g. continuous exposure).
6. **POD Basis:** - RfC based upon reduced brain weight in rat pups at 6 weeks of age in a rat developmental inhalation exposure through gestation and 3,6, or 8 weeks postnatal.
7. **POD Benchmark MOE:** -
    a. This POD requires an HQ assessment, not an MOE comparison. The RfC was derived with PBPK modeling and the following UFs:
        i. UF human = 10
        ii. UF animal = 3
        iii. UF database = 3

Reference: - US EPA. 2013. Toxicological Review of Methanol (NonCancer). EPA/635/R-11/001Fa. www.epa.gov/iris

[redacted]

3 HUMAN HEALTH RISK (PART B)

3.1 USES and EXPOSURES

3.1.1 Uses

Resin/binder in paint formulations for industrial and architectural applications. Si-OMe [redacted]

3.1.2 Worker Exposure

3.1.2.1 Inhalation

Processing: Formulation of Coating

Negligible (VP < 0.001 torr). Generation of mists, aerosols or particulates not expected from blending operations.

Use: Application of Industrial and Architectural Coatings

PDR = [redacted] mg/day over 100 days/yr

(Basis: Coating Using Hand-Held Spray Gun)

3.1.2.2 Dermal

Processing: Formulation of Coating

PDR = [redacted] **mg/day** over [redacted] days/yr (Liquid, 80%)

(Basis: Unloading Liquid Raw Material from Drums)

Use: Application of Industrial and Architectural Coatings

PDR = [redacted] mg/day over 100 days/yr (Liquid, 50%)

(Basis: Unloading Liquid Raw Material from Drums)

3.1.3 General Population Exposure:

3.1.3.1 Drinking Water

ADR as high as **7.33E-03 mg/kg/day**

3.1.3.2 Fish

ADR as high as **2.38E-04 mg/kg/day**

3.1.3.3 Air/Inhalation

ADR as high as **3.29E-02 mg/kg/day (fugitive)**

[redacted]

Exposure Scenario[1]	Water						Landfill	Stack Air		Fugitive Air	
Release activity(ies)[2]; exposure calculation(s)[3]	Drinking Water		Fish Ingestion		7Q10[4] CC = 1000	PDM Days Exceeded	LADD	ADR (24-hr conc.)	LADD (Annual conc.)	ADR (24-hr conc.)	LADD (Annual conc.)
	ADR	LADD	ADR	LADD							
	mg/kg/day	mg/kg/day	mg/kg/day	mg/kg/day	µg/l	# Days	mg/kg/day	mg/kg/day (µg/m^3)	mg/kg/day (µg/m^3)	mg/kg/day (µg/m^3)	mg/kg/day (µg/m^3)
PROC:Max ADR: max acute eco	**7.33e-3**	--	**2.38e-4**	--	**3.32e+2**	--	--	-- **(--)**	-- **(--)**	-- **(--)**	-- **(--)**
PROC:Max LADD	--	**1.34e-5**	--	**9.65e-8**	--	--	**1.31e-4**	-- **(--)**	-- **(--)**	-- **(--)**	-- **(--)**
USE:Max ADR: max acute eco	**2.12e-3**	--	**6.89e-5**	--	**9.60e+1**	--	--	-- **(--)**	-- **(--)**	**3.29e-2 (1.80e+2)**	-- **(--)**
USE:PDM1	--	--	--	--	**9.60e+1**	**0**	--	-- **(--)**	-- **(--)**	-- **(--)**	-- **(--)**
USE:PDM2	--	--	--	--	**5.35e+1**	**0**	--	-- **(--)**	-- **(--)**	-- **(--)**	-- **(--)**
USE:Max LADD	--	**2.16e-5**	--	**1.56e-7**	--	--	**1.24e-3**	-- **(--)**	-- **(--)**	-- **(--)**	**3.01e-4 (3.89e+0**

3.1.4 Consumer Exposure

No identified consumer exposures

[redacted]

3.2 RISK CALCULATIONS

3.2.1 Worker Calculations

Lung effects-TMS

Worker Margin of Exposure (MOE) Calculations using Animal Oral POD and Engineering Report PDR

	Animal or Human			Human							Benchmark MOE	Endpoint Type
Exposure Route	POD mg/kg-day	POD Exposure Duration Days/Wk	POD Route % Absorp	Exposure mg/day Potential Dose Rate (PDR)	Exposure Duration Days/Wk	Exposure Route % Absorp	Body Weight kg	Exposure mg/kg-day	Structural Alert as % of PMN	Margin of Exposure MOE	100	NOAEL
Inhalation	1.1E+01	5	100%	1.5E+02	5	100%	80	1.9E+00	100%	**5.9**	Fold Factor = 17.04545	

Risks were identified workers, for lung effects via inhalation based on quantitative hazard data for an analogue, trimethoyxy silane, (MOE = 5.9; benchmark MOE = 100). Inhalation fold factor 17.

Methanol

Worker Margin of Exposure (MOE) Calculations using Animal Oral POD and Engineering Report PDR

	Animal or Human			Human							Benchmark MOE	Endpoint Type
Exposure Route	POD mg/kg-day	POD Exposure Duration Days/Wk	POD Route % Absorp	Exposure mg/day Potential Dose Rate (PDR)	Exposure Duration Days/Wk	Exposure Route % Absorp	Body Weight kg	Exposure mg/kg-day	Structural Alert as % of PMN	Margin of Exposure MOE	1	RFD
Dermal	2.0E+00	5	100%	1.8E+03	5	100%	80	2.3E+01	100%	**0.1**	[redacted]	[redacted]

Risks were identified workers for neurotoxicity and developmental effects via dermal exposure based on Methanol (MOE = 0.1; benchmark MOE = 1).

Worker Margin of Exposure (MOE) Calculations using Animal Oral POD and Engineering Report PDR

	Animal or Human POD			Worker Exposure				Human Breathing Rates						Benchmark MOE	Endpoint Type
Exposure Route	POD Conc. mg/m^3	POD Period hrs/day	POD Duration days/wk	Exposure mg/day Potential Dose Rate (PDR)	Total Worker Breathing Volume for PDR Exposure Period m^3	Worker Exposure Duration Hours/Day	Exposure Duration Days/Wk	Default	Worker	Structural Alert as % of PMN	POD Conc - Duration & Breathing Rate Correction $Scenario_{HEC}$ mg/m^3	Exposure TWA mg/m^3	**Margin of Exposure MOE**	1	RFD
Inhalation	2.0E+01	6.00	5	1.5E+02	10.0	8.00	5	4 90	10.00	100%	7.4E+00	1.5E+01	**0.49**	Fold Factor =	2.0

Risks were identified workers for neurotoxicity and developmental effects via inhalation exposure based on Methanol (MOE = 0.49; benchmark MOE = 1).

3.2.2 General Population Calculations

[redacted]

Population/Consumer Margin of Exposure (MOE) Calculations using Animal Oral POD and Exposure Report ADR											
	Animal or Human			Human						Benchmark MOE	Endpoint Type
Exposure Route	POD mg/kg-day	POD Exposure Duration Days/Wk	POD Route % Absorp	Exposure mg/kg-day Acute Dose Rate (ADR)	Exposure Duration Days/Wk	Exposure Route % Absorp	Multiplier for Susceptible Subpopulations	Structural Alert as % of PMN	Margin of Exposure MOE	1	RFD
Drinking Water	2.0E+00	5	100%	7.3E-03	7	100%	1.0	100%	**194.89**		
Drinking Water	2.0E+00	5	100%	7.3E-03	7	100%	4.2	100%	**46.40**		
Fish Ingestion	2.0E+00	5	100%	2.4E-04	7	100%	1.0	100%	**6,002.40**		

Risks were not identified for the general population for neurotoxicity and developmental effects via drinking water and fish ingestion exposure based on methanol (MOE = 46; benchmark MOE = 1).

Population/Consumer Margin of Exposure (MOE) Calculations using Animal Oral POD and Engineering Report PDR											
	Animal or Human POD			Population Exposure						Benchmark MOE	Endpoint Type
Inhalation Exposure Scenario	POD Conc. mg/m^3	POD Period hrs/day	POD Duration days/wk	Exposure (24-hr conc.) (ug/m3)	Population Exposure Duration Hours/Day	Exposure Duration Days/Wk	Structural Alert as % of PMN	POD Conc - Duration Correction - $Scenario_{HEC}$ mg/m^3	**Margin of Exposure MOE**	1	PEL
Fugitive air inha	2.0E+01	6.00	5	1.8E+02	24.00	5	100%	5.0E+00	**27.78**		

Risks were not identified for the general population for neurotoxicity and developmental effects via fugitive air inhalation exposure based on methanol release (MOE = 28; benchmark MOE = 1).

Population/Consumer Margin of Exposure (MOE) Calculations using Animal Oral POD and Exposure Report ADR											
	Animal or Human			Human						Benchmark MOE	Endpoint Type
Exposure Route	POD mg/kg-day	POD Exposure Duration Days/Wk	POD Route % Absorp	Exposure mg/kg-day Acute Dose Rate (ADR)	Exposure Duration Days/Wk	Exposure Route % Absorp	Multiplier for Susceptible Subpopulations	Structural Alert as % of PMN	Margin of Exposure MOE	100	NOAEL
Fugitive Air Inhalation	1.1E+01	5	100%	3.3E-02	7	100%	1 0	100%	**238.82**		

Risks were not identified for general population for lung toxicity via fugitive air inhalations based on quantitative hazard data for the analog trimethoxysilanes (MOE= 238; benchmark MOE=100)

3.2.3 Consumer Calculations

Risks were not assessed because consumer exposures are not expected